Master Plan for the Historic Town of Clifton, Virginia

September 2012

Prepared by:

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In Association With:

JC engineers

Wetland Studies and Solutions, Inc.

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Executive Summary

Introduction and Background

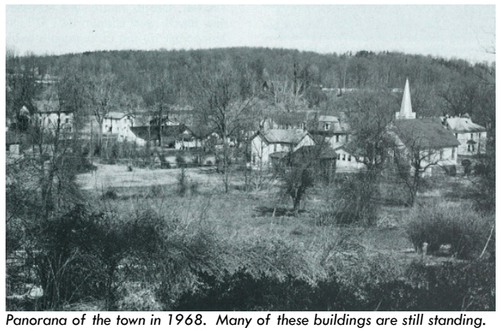
The Town of Clifton, Virginia is a small village of approximately 280 people in the southern portion of Fairfax County. Clifton was incorporated by the Virginia General Assembly on March 9, 1902.

Although Native Americans had been living within the vicinity for thousands of years, in the later 1700s, William Beckwith obtained title to 1200 acres along Popes Head Creek and European settlement of the area began. Spurring this settlement was the completion of a segment of the Orange and Alexandria Railroad in 1852; this segment crossed Beckwith's land and served as a strategic point during the Civil War. The Town of Clifton was established as a siding for loading firewood on trains in 1863. At this time, the siding was called Devereux Station. The Town served as the southernmost point of the Union Army and was used to house soldiers to protect the railroad against Confederate troops. Also in 1863, William Beckwith died and, as he had no heirs, his estate was sold with some of the parcels to be distributed to his freed slaves.

In 1868, Harrison Otis emigrated from the north and purchased portions of Beckwith's estate, including Devereux Station. Shortly thereafter, the name was changed to Clifton Station and a post office began operation with Otis as the postmaster. Otis attempted to establish a vineyard and built the Clifton Hotel. By 1870, Otis had expanded his enterprises to include milling. Clifton grew quickly and, by 1878, the Town was home to 20 families and contained four churches, a school, saw and grist mills and a tavern.

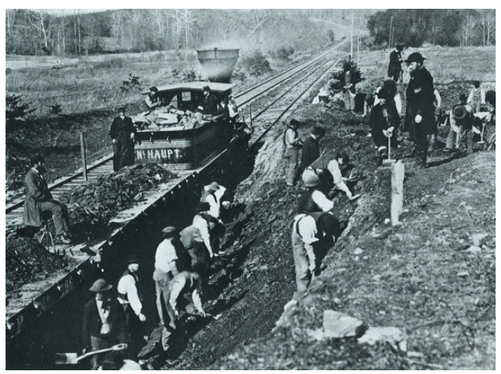
With its strategic position along the railroad, the Town quickly became a summer retreat for the wealthy who wished to escape the hot, humid conditions of Washington, D.C. and the more urban areas. In 1900, the Buckley Store was opened to serve the greater Clifton community and the Town was incorporated in 1902. Clifton was the first Town to obtain electric power in 1925 and the first high school in Fairfax County was established here. After its heyday in the first decade of the 20th century, growth in the Town slowed and little development has occurred within the Town limits since this time, preserving its turn of the century appearance.

Federal troops guarding the Orange and Alexandria Railroad near Devereux Station. Library of Congress.



Panorana of the town in 1968. Many of these buildings are still standing. Photo by Wm. Edmund Barrett.

Looking south at the Clifton Freight Depot circa 1918. Photo courtesy of Jane Ayre Lion.

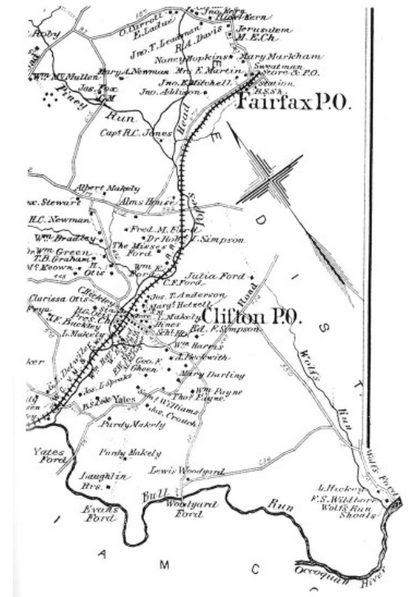


General Herman Haupt supervises work on the wye at Devereux Station for the Union's U.S. Military Railroad in 1863. Library of Congress.

The proposed project is located within the Clifton Historic District which has been recorded as DHR 194-003. The Clifton Historic District extends along Main Street and originally included 62 buildings (six of which are non-contributing). The district includes primarily vernacular frame buildings constructed between 1880 and 1910; the period of significance is between 1868 and 1910. The buildings were surveyed in 1985 as part of the preparation for a National Register Nomination. Additional survey was conducted in 2006. The Clifton Historic District was listed on the National Register of Historic Places (NRHP) and the Virginia Landmarks Register in 1985. The Town applied to the Virginia Department of Historic Resources (DHR) in 2010, as DHR 194-5001, to designate Clifton Elementary School as a historical building. DHR found the school to be not eligible as it is not a contributing structure to the historic district based on the typical architecture and the time frame in which the school was built and operated was not in a period of significance to the district.

Like many towns throughout the Washington, DC Metropolitan area, Clifton has become a popular location for residents seeking reprieve from the sprawling suburban metropolis of Northern Virginia. Its quaint culture of small restaurants and shops, historic residential structures, natural features, and accessibility has earned it notoriety throughout the metropolitan region and nationally, amongst historic preservationists.

The town of Clifton has a significant transportation burden caused by rush hour and cut-through traffic. Virginia route 645, named Clifton Road in Fairfax County, ahnd Main Street within the border of the Town, carries commuters from development centers along the US 29 and Interstate 66 corridor to the US 1 and Interstate 95 corridor through a series of back roads. Clifton Road, between Braddock Road and Route 123, is designated as a Scenic and Historical Byway. Traffic counts provided by the Virginia Department of Transportation (VDOT) estimated that rush hour volumes send approximately 10,500 vehicles per day along Main Street with a town of only 280 residents. The Town has requested and received increased traffic signage, including several stop signs. Several "rumble strips," also have been installed to slow the speed of traffic entering the Town. The Town has requested the Fairfax County Police Department to substantially increase its visibility and traffic control in the Town. Likewise, the Norfolk Southern railroad and the Virginia Railway Express (VRE) rail line bi-sects the Town and while not having a rail station; the frequency of rail activity disrupts Main Street during the morning and evening rush. These volumes of traffic, coupled with a normal flow of goods and services for the Town's residents and business patrons, often overshadows the quaint character of Clifton making vehicular and pedestrian circulation throughout the Town particularly difficult.



Excerpt from Clifton area map from Hopkins Atlas, 1878

The Clifton Hotel was built by Harrison G. Otis in 1870. Photo in 1968 by Wm. Edmund Barrett.

Road repairs are necessary due to poor drainage throughout the Business District.

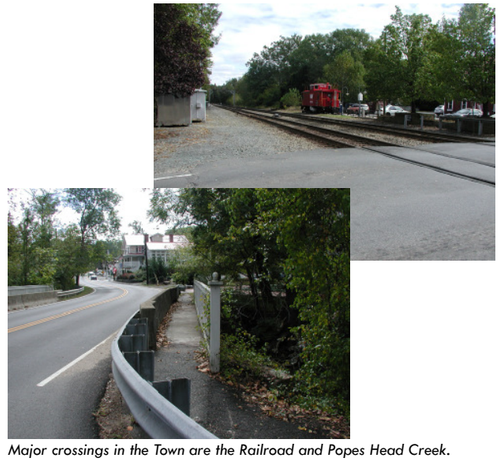
Grading and drainage has caused unsightly inlets.

Overhead utilities and poles stand out as unattractive vertical elements.

Another component influencing the Town's character is its infrastructure. Like the vast majority of the localities throughout Virginia, Clifton's roads and sidewalks are constructed, owned and maintained by VDOT. Over the years, milling and paving as a component of standard maintenance have caused drainage issues that have been retrofitted to solve issues of flooding. Overhead utilities are also a predominant feature to the Town where in many instances utility poles conflict with pedestrian walkways and vehicular circulation and parking. All of these components manifesting over time has impacted the aesthetics of the Town presenting challenges to its streetscape and character.

Recognizing these challenges the Town of Clifton sought assistance to improve their streetscape. In 2005, the Town applied for and received a grant from the Federal government through an appropriation from Congressman Tom Davis. The grant: Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) administered through VDOT's Enhancement Grant program was appropriated by the Town to fund a Streetscape Master Plan to serve as a future guideline to the Town for implementation and funding for improvements to Main Street. The Town of Clifton procured the project through the VDOT protocol. In March of 2011, the Town awarded the project to Land Planning and Design Associates (LPDA), a Virginia based Landscape Architecture and Planning firm specializing in Urban Design projects funded through the VDOT Enhancement Grant Program. LPDA and its sub consultants: J2 Engineers and Thunderbird Archaeology conducted the work and coordination for the Streetscape Master Plan. The study area was to include Main Street (VA 625) from the intersection of Newman Road and Clifton Road extending south to Clifton Heights Lane with connectivity considerations for vehicular and pedestrian upgrades along Chestnut Street, Chapel Street, School Street, and Clifton Creek Road and pedestrian accommodations to Clifton Town Park and Clifton Elementary School. This report is a summary of those efforts.

Sidewalks are narrow and overgrown.



Major crossings in the Town are the Railroad and Popes Head Creek.

Site Analysis:

Several noted improvements of Clifton's streetscape allow for immense opportunities to improve the Town of Clifton. The expansion of pavement by VDOT over time has allowed for ample width for travel lanes, parking and pedestrian improvements. In most instances, the right of way throughout the Clifton Business District and residential areas of Town is paved edge to edge. Currently, parking is unorganized without clear definition of spaces and considerations for sight distances from intersections, utility poles, and conflicts with sidewalks. While this condition presents challenges in its current form, the width of pavement provides an opportunity to reorganize the utilization of this space without significant impacts to infrastructure.

Like most small historic towns, the original right of way and property boundaries have not been modified over time to sync with the improvements of the town and additions of private residences and infrastructure. Prior to the engagement of the LPDA team, the Town initiated a right of way survey that included the location of utilities during the Master Plan process. The survey reflected some minor conflicts, such as fences and planters, but the majority of the existing and proposed improvements of the streetscape are contained within the existing right of way. Exception is taken where utility poles are constricting sidewalk widths.

The Town also has two pertinent crossings contributing to its streetscape: the railroad crossing in the center of Town and the pedestrian and vehicular crossings of Pope's Head Creek. The linkage continues north from the Clifton Business District to the former site of Clifton Elementary School, Clifton Creek Road, the newly completed Floodplain Park. The railroad crossing is currently served by pedestrians with an asphalt paved sidewalk on the west side of Main Street. Pope's Head Creek is crossed by a bridge carrying pedestrian and vehicular traffic. While the existing bridge at Pope's Head is effectively carrying pedestrians across it is not compliant with the American with Disabilities Act (ADA).

Most traffic through the Town comes through the northern gateway, commonly referred to by residents as 'The Triangle', along Main Street towards Clifton Road via School Street to reach Prince William County. There is a significant shift in the volume of traffic south of School Street into the predominantly residential area of the Town. Traveling south from that point, volumes are significantly reduced at the southern gateway to Town, near Clifton Heights Lane continuing south into areas of rural Fairfax County along Kincheloe Road. 'The Triangle' presents several challenges as it is a speed reduction point and the first introduction into the Town character from the rolling section of Clifton Road north of Town. This intersection of Clifton Road, Newman Road, and Main Street is split by a large landscaped island with stopping movements entering and leaving Town. The island is a large landscaped bed with a small painted wood sign welcoming drivers into the Town. This area is also used for event signage for various Town festivals and functions. There are no pedestrian accommodations at 'The Triangle'.

Pavement spans entire R.O.W. through the Business District.

Travel lanes, sidewalks and property lines create a tight area at the edge of the R.O.W.

North gateway entry at Clifton Road and Main Street Intersection

The southern gateway into Town is a high hilltop flanked by existing residences. A newer subdivision called Clifton Heights is at the crest of the hill. The roadway and pedestrian connections are very narrow coming into the Clifton Business District and in some instances narrowed by utility poles in the sidewalks. Residents of Clifton Heights often utilize the roadway when walking into Town as there is not a pedestrian linkage between their development and the business district. Several other streets within the Town intersect into Main Street including major intersections at both Chapel Road and School Street. Only a limited segment of Chapel Road carries pedestrians to the Town Hall and businesses along the corridor.

The Town is served by private wells and public sewer. Sewer lines share right of way with VDOT. Storm sewer is handled by a series of inlets along travel lanes of Main Street primarily at intersections. Over the years, improvements to the inlets have not kept up with the roadway widening and paving which have created significant differences in elevation between the inlet tops and the road surface. This condition often creates a popping or pothole effect particularly for large trucks or trailers making turning movements. While the inlets themselves seem to be in the proper location, an abundance of pavement and wide sweeping turning movements can create conflicts with parked vehicles and pedestrians.

During the Master Plan process, the LPDA team spent a great deal of time within the study area observing the habits of drivers and pedestrians throughout the corridor as well as meeting with stakeholders to understand their concerns about the day to day functionality of the space. The summary of these observations were that the infrastructure had the capacity to support the functions needed and warranted for Clifton's condition; however, lack of clear definition of space and an overabundance of pavement manifested years of 'bad habits' amongst residents, visitors, and passersby that could be corrected.

Southern gateway entry atop the hill with no pedestrian access.

Inlets located within turning movements at busy intersections.

School Street and Main Street Intersection with large pavement areas.

Survey Base Information:

The survey base information was developed by Rice Associates Inc., July 2008, as a VDOT Survey On-call assignment (UPC# 80798). The survey limits are approximately 200 feet wide along Main Street, beginning approximately 600 feet north of the Main Street and Clifton Road intersection and ending approximately 350 feet south of Clifton Heights Lane.

The topography was compiled from aerial photography dated March 29, 2007 from Aero-Metrics. The project was developed on VDOT Project Coordinate System and used NAVD 1988 vertical datum.

The survey base information included right of way, property lines, recorded easements, overhead utilities, sanitary sewer, drainage and physical features such as sidewalks, fences, trees, building, etc.

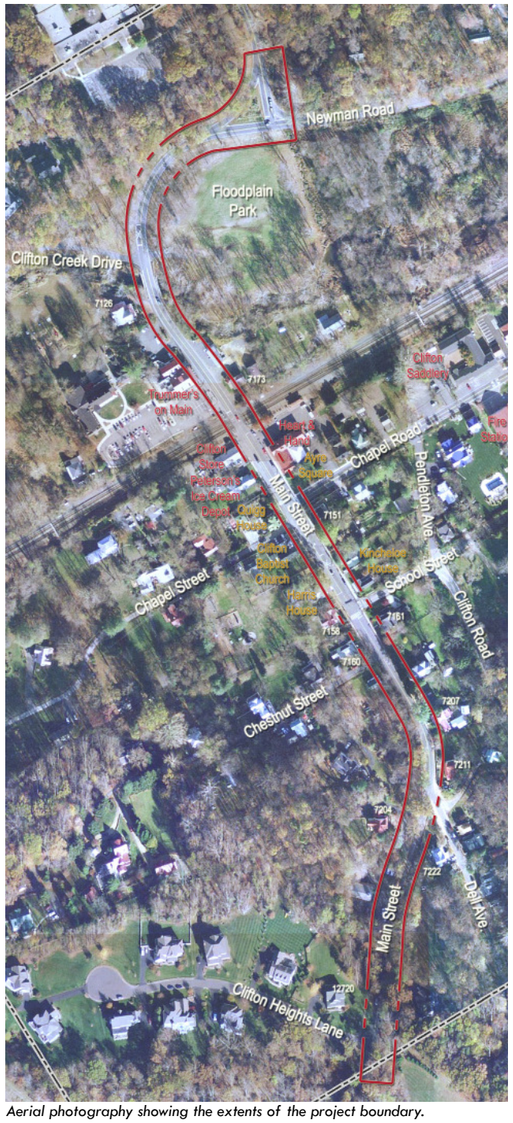
Streets/Sidewalk/Storm Inlets/Utilities:

A visual inspection and review of the streets and hardscape along Main Street was performed. Below is a summary of the field investigations performed in October 2011.

Roadway

In general, asphalt within the travel lanes appears to be in good condition.

- Ponding was observed in front of the Clifton General Store and the entrance to the Caboose Plaza.
- Longitudinal cold joint cracking was found at the intersections of Chapel Road, Chapel Street and School Street.
- Paved swale areas along Main Street are showing signs of deterioration where the water is being conveyed along the asphalt. Typically water is collected and conveyed along a concrete channel or curb.
- Excessively depressed areas are adjacent to existing storm inlets at the intersections of Chapel Road, Chapel Street and School Street. Pavement at the intersection of Chapel Street shows deterioration.
- Elevation breaks between the roadway and sidewalk at Chestnut Street.
- Visible cracking adjacent to the speed bump between School Street and Chapel Street.
- Signage and utility poles are located within paved areas on Main Street.



Aerial photography showing the extents of the project boundary.

The sidewalk in front of the Buckley Building is outside of the R.O.W. and on private property.


Potential tripping hazards are found in many locations.


Utility poles, vegetation and parking all create unsafe conditions for pedestrians.

Sidewalk

Visually the sidewalks appear to be in good condition.

- It was found that portions of the existing sidewalk on Main Street, north of Chapel Road are located outside the existing right of way.
- Potential tripping hazard was found at the beginning of the sidewalk at the entrance to the Caboose Plaza.
- Existing utility poles, guy wires and service connections at the pole create obstructions adjacent to the sidewalk network in town.
- Pedestrian facilities north of the railroad crossing are none existent.
- Connectivity of pedestrian facilities at the south end of town should be completed. Preliminary evaluations of the pedestrian facilities along Main Street from Clifton Heights Lanes north shows challenging terrain and potential utility conflicts which make completing the network difficult without acquiring easements from adjacent landowners. It may also be difficult/cost prohibitive to construct this connection to meet ADA standards.
- It should be noted that during a number of site visits, it was found that vehicles, vegetation and merchant signage either blocked or obstructed the sidewalk network between Dell Avenue and the railroad crossing.


Pedestrian accommodations north of the railroad tracks are non-existent.

Storm Inlets

Visually the inlets appear to be in fair to poor condition.

- The additional paving around the inlets has created large depressions localized at the intersections. Inlets around Chapel Street and Chapel Road could present issues for handicapped pedestrians.
- There are broken grates on the inlets and silting was present.
- No evaluation was made of the inlets or pipes below the surface.
- It was noted that a few property owners were releasing concentrated runoff across the sidewalks.

Above Ground Utilities

Visually the facilities appear to be in good condition.

Apparatuses associated with the aerial utilities (guy wires, conduit, pedestals, etc.) are located in the pavement areas or closely adjacent to the sidewalks.
Under a prior agreement, the Town had installed underground conduit from the pole adjacent to the entrance to Peterson's Ice Cream Depot across Main Street to an existing pole located on Chapel Road. Businesses along Main Street appear to be serviced by overhead service drops from the poles.


Overhead utilities between Peterson's Ice Cream Depot and Clifton Cafe.


Overhead utilities adjacent to Clifton General Store.


Overhead utilities between Clifton Cafe and General Store.


Overhead utilities spanning Main Street and the Clifton Business District.


Loss of asphalt due to breakage and erosion.


Additional paving around inlets has created dips in the road.


Overhead utility on west side of Main Street.

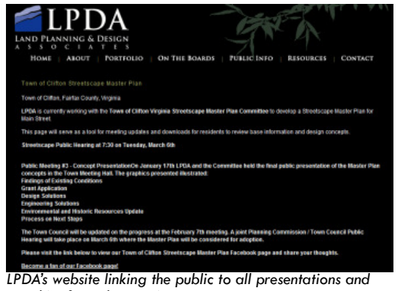
Goals and Objectives

Following the Site Analysis and Observations, the LPDA team entered into the design and public participation process. The Town Council appointed the Streetscape Master Plan Committee (SMPC) which comprised a cross section of residents, business owners, a Town council representative, and sub-committee members from Special Projects Committee to work with the consultant team and the Town, with the goal of providing an ample amount of public outreach. A representative from VDOT attended several meetings during the project. Several factors influenced the public process:

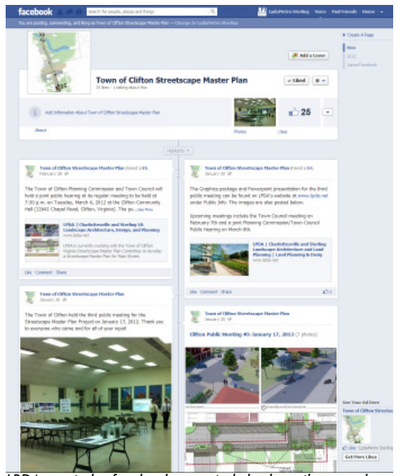
- Accessibility to key decision makers and information about the project
- Compliance to the goals for the Clifton Comprehensive Plan
    - Considerations for public parking
    - Stronger and safer pedestrian connectivity
    - Traffic Calming Measures
    - Functional Pavement Design
    - Preservation of the Historic Town Character
    - Consolidation of Traffic Signs
    - Improvements to Intersections functionality and safety
    - Improvements to Sidewalk functionality and safety
    - Determination of Right-of-way
    - Utility organization
- The ability of the public to be involved in the design process
- Ultimate adoption of the Streetscape Master Plan by the Planning Commission and Town Council

Throughout the process, LPDA and members of the SMPC ran an extensive outreach campaign including online, print and social media, accessibility to plans and presentations on both the Town's and LPDA's websites, through distribution and posting of flyers, and emails. The meetings were held in the Town Hall and conducted in an open forum style allowing residents to walk through and review exhibits, talk to members of the LPDA team and the SMPC, hear a presentation by the consultants and then have a question and answer period. Several review meetings were held between each stage of the project by the SMPC and LPDA.

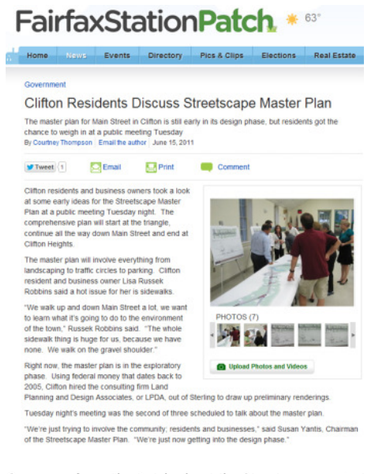
Advertisement for public meetings.



LPDA's website linking the public to all presentations and graphics from the meetings.



LPDA created a facebook page to help share the new plans and get feedback from residents.



Coverage from The Patch about the Streetscape project. Courtesy of Fairfax Station Patch.


LPDA answering questions about the concepts. Courtesy of Fairfax Station Patch.


LPDA preparing for public presentation and discussions.


LPDA presenting designs to the audience. Courtesy of Fairfax Station Patch.


Public discussing concepts with the design team. Courtesy of Fairfax Station Patch.

The first meeting of the public process was on April 28th, 2011 and was to achieve the following goals:

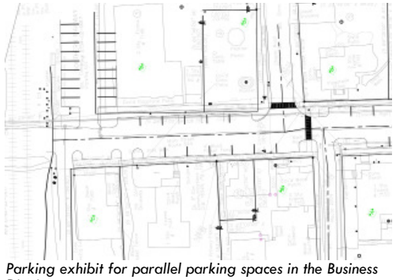
- Introduce the project team
- Review the opportunities and constraints of the existing conditions
- Educate the public on the function of the Streetscape Master Plan
- Show examples of like projects and solutions
- Review schedules
- Discuss Funding
- Receive public comment about concerns and programming opportunities

Public comment confirmed that the residents were concerned about high impact and high cost solutions for the project. Business owners and political leaders remarked that the volume, ease, and functionality of the parking were imperative to the success of the Town and the Master Plan. The general consensus echoed the goals set forth in the Comprehensive Plan with the understanding that the Town had limited resources and that generally the public wanted the streetscape 'fixed' not completely overhauled.

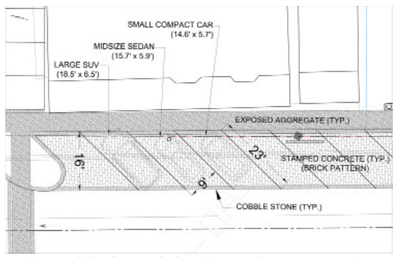
Following the first public information meeting, LPDA and the SMPC worked to employ the goals and objectives expressed by the public to the existing site conditions.

The second public information meeting was held on June 14th, 2011 and focused on presenting several design alternatives for each of the key areas of the project and providing a concept for the overall pedestrian network. The areas of focus were:

- Environmental mitigation of runoff
    - Water quality solutions
    - Best Management Practices (BMP)
    - Mitigation of existing drainage problems
- Expansion of the existing sidewalk network, specifically
    - Safe access to Clifton Heights
    - Sidewalk along School Street
- Delineation of pedestrian crosswalk and walkways
- Mitigation of utility conflicts
- Opportunities for landscaping
- Traffic calming through populating the space and narrowing the roadway
- Parking
    - Alternatives for parallel and angled parking
- Functional pavement design of key intersections to improve safety
    - Dell Avenue and Main Street
    - School Street and Main Street
    - Chapel Road and Main Street
    - The Triangle



Parking exhibit for parallel parking spaces in the Business District.



Parking exhibit for angled parking in the Business District.

The goals set forth by public comment from the second public meeting was that parking is a premium and the design solution must net the same or a higher number of parking spaces within the proposed design. Pedestrian connectivity along School Street and to Clifton Heights was going to be a priority although residents realized the physical challenges associated with making the Clifton Heights connection. Finally, the solution for The Triangle was going to require keeping the existing circulation; however the public agreed that a lower maintenance-higher impact solution was warranted.

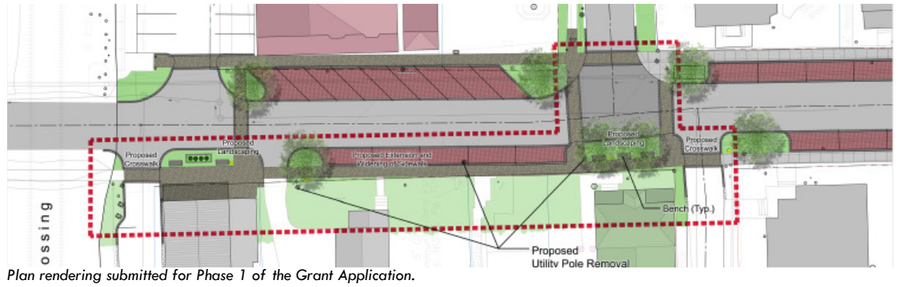
A design for a traffic circle in place of the current triangle was created and well received by residents of the Town. The circle would remain in the current right-of-way, provide a notable entry to the Town, serve as a traffic calming device and alleviate the flow of traffic during rush hour. Many concerns that stem from the current functionality of the triangle would be remedied. It was decided that while this solution was desirable, it was not in the Town's best interest to pursue this solution at this time although it may be in the near future.

A large component of discussion of the SMPC and public was the lack of curbs within the Town. Unlike most Towns, Clifton's complete absence of standard curb and gutter were the root of the drainage problems and pedestrian and vehicular conflicts that the Town was having. Understanding the functions of funding and the potential cost associated with a major street section overhaul, LPDA and the SMPC secured ECS, Mid Atlantic, a geotechnical engineering firm, to provide sections of the Town's pavement. The results determined that the Town did not have enough pavement cross section to lower the street elevations to facilitate the addition of curb and gutter.

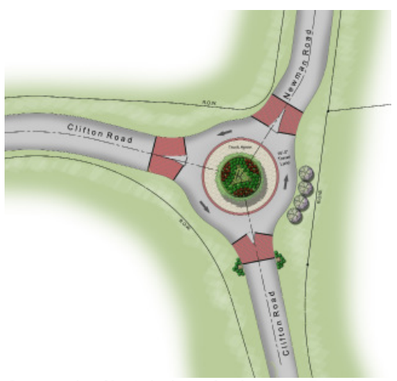
The final public information meeting was held on January 17th, 2012. The goal of this public meeting was to present the following elements:

- Findings of the geotechnical investigation into the pavement corings
- Updates on the grant application for future project funding
- Solutions for
    - Clifton Business District
        - Parking
        - Overhead utility mitigation
        - Drainage
        - BMP
        - Lighting
        - Landscape

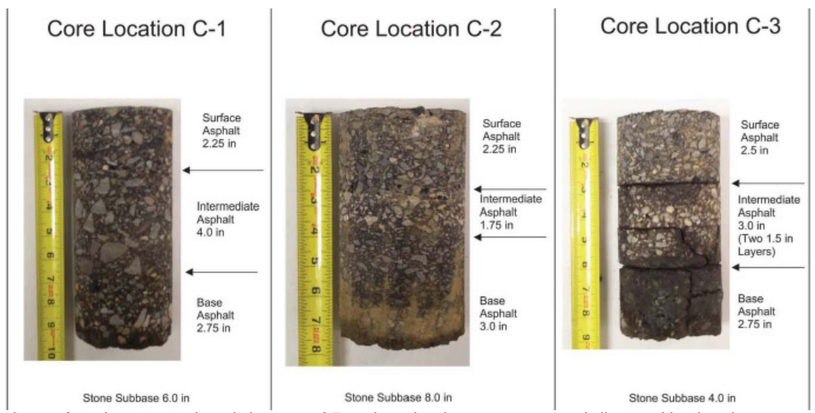
Three dimensional rendering of the proposed Clifton Business District at the Buckley Building looking north toward the railroad tracks.



Plan rendering submitted for Phase 1 of the Grant Application.



Conceptual traffic circle design for the current Triangle.

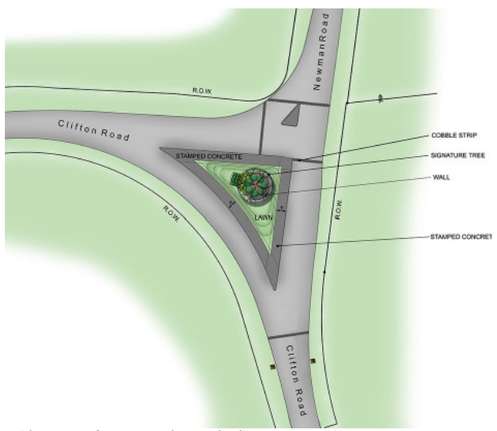


Corings from the pavement through the center of Town shows that the cross section is to shallow to add curb and gutter.

- The Triangle
    - Pavement markings
    - Walls
    - Signage
    - Landscape

Walls, signage and landscape for the new Triangle design.

Entry pillar for north and south Town limits.



Plan view of conceptual triangle design.

- Site Furnishings
  - Benches
  - Trash receptacles
  - Lighting
  - Signage

Rodman Backless bench by Belson.

Hagerstown Street Lamp by Hadco.

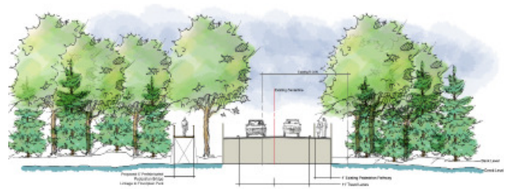
Victor Stanely ES-242 trash can.

Comprehensive Sign Plan package for the Town.

- Parking

Parking on both sides of Main Street.

- Pedestrian access
  - Popes Head Creek
  - Clifton Heights



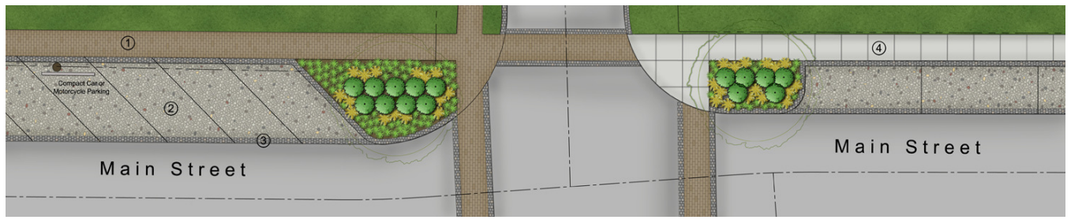
Pedestrian access over Popes Head Creek.

- Engineering concepts
  - Drainage
  - BMP
  - Mitigation of inlet conflicts

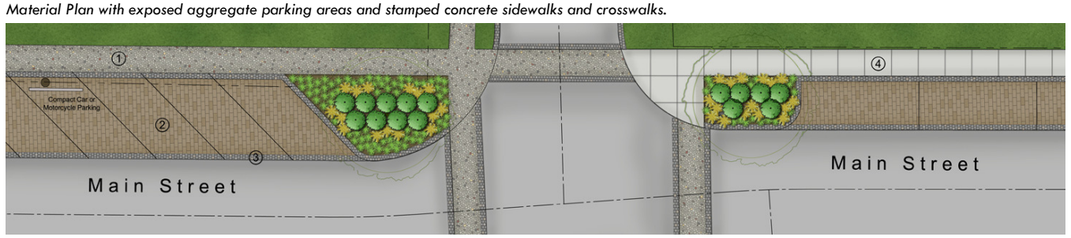
Demonstration of Bio-Retention area.

- Material alternatives for
  - Sidewalk
  - Parking areas
  - Crosswalks

Optional location for trail from Clifton Heights.



Material Plan with exposed aggregate parking areas and stamped concrete sidewalks and crosswalks.



Material Plan with stamped concrete parking areas and exposed aggregate sidewalks and crosswalks.

Findings and Recommendations

Design:
The final recommendations set forth from the SMPC and Town Council approval are attached as an appendix to this report generally.

Archaeological Findings
No adverse impacts to historic resources will occur as a result of the master plan.

The proposed streetscape improvements were reviewed by the State Historic Preservation Office (SHPO) to comply with the National Historic Preservation Act. The SHPO determined that the proposed streetscape improvements would not have an adverse effect on the Clifton Historic District. A copy of this determination is attached.

No further reviews or coordination regarding cultural resources is necessary at the Master Plan level, however, it is anticipated that DHR will have comments as the project moves through construction documents.

Geometric Design Standards:
The Main Street enhancement project utilizes current VDOT design standards, Urban Local Street, GS-8. The Master Plan evaluation of Main Street proposes to implement the use of Context Sensitive Street Design measures.

Context Sensitive Street Design (Context Sensitive Solutions - CSS) is a theoretical and practical approach to transportation decision-making and design that takes into consideration the communities and lands through which streets, roads, and highways pass ("the context"). The term is closely related to but distinguishable from context-sensitive design in that it asserts that all decisions in transportation planning, project development, operations, and maintenance should be responsive to the context in which these activities occur, not simply the design process. CSS seeks to balance the need to move vehicles efficiently and safely with other desirable outcomes, including historic preservation, environmental sustainability, and the creation of vital public spaces.

For the purpose of this Master Plan, four primary means CSS are suggested for implement on Main Street in Clifton.

- Narrow Street Widths
- Improving Pedestrian Safety
- Flexible Parking Requirements
- Low Impact Development (LID)

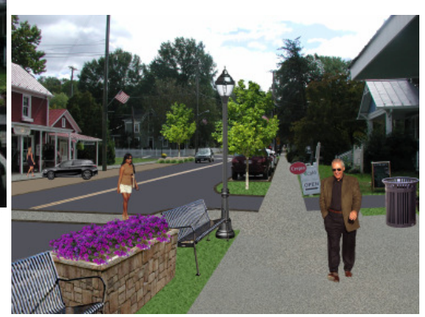
Narrow Street Widths
Narrowing Street Widths are the first step in development of a green street design. By retrofitting or redeveloping a street, opportunities to eliminate unnecessary impervious areas were explored to reduce runoff and to assist in establishing/promoting other safer modes of transportation within the town.

Improving Pedestrian Safety
Providing Choker Islands are traffic calming measures. They are used to slow traffic, but located properly along Main Street, choker islands reduce the pedestrian crossing distance lowering pedestrian exposure and creating a safer pedestrian environment.

Flexible Parking Requirements
Clifton's business district has limited parking and land available for parking. Context Sensitive Solutions approach allows the Clifton to investigate parking alternatives and work with VDOT on ways to implement flexible parking requirements. Angular parking is one option to assist Clifton in achieving additional parking spaces.

Low Impact Development (LID)
Low Impact Development (LID) is an innovative and natural stormwater management approach managing rainfall runoff. Reduction of pavement width (Narrowing Streets) is one form of LID, by reducing the impervious areas along the existing street sections.
Retrofitting choker islands will allow the town an opportunity to develop Bio-retention facilities. Bioretention is a versatile green street strategy. Bioretention features can be tree boxes taking runoff from the street, indistinguishable from conventional tree boxes. Bioretention features can also be attractive attention grabbing planter boxes or curb extensions.

Clifton will need to develop an agreement with VDOT for maintenance of any LID measures proposed within the right of way. These facilities will need to be installed and maintained under a land use permit.



Before and After photo simulation of streetscape in front of Clifton Store south of the railroad tracks.

Before and After photo simulation of streetscape in front of Trummer's north of the railroad tracks.

Before and After photo simulation of streetscape in front of residential area south of the railroad tracks.